

**U.S.ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY  
540 S. MORRIS AVE., MONTGOMERY, AL 36115  
TH ANALYSES**

**REPORT OF SAMPLE DELIVERY GROUP #1600017**

Project: Canadian Radium & Uranium, Mt. Kisco, NY  
 Analysis method: Isotopic Thorium Using NaOH Fusion  
 Report ID: 1600017-TH  
 Report type: Original  
 Date reported: 06/29/2016  
 Total pages in report: 29

**SAMPLES**

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04138J	C3-SB9-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04139K	C3-SB9-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04140C	C3-SB10-0012-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04141D	C3-SB10-1224-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04142E	C3-SB10-6072-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04143F	C3-SB10-7284-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04144G	C3-SB10-8496-01	NY:MT. KISCO	SOIL	04/05/2016	04/19/2016
B6.04145H	C3-SB11-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04146J	C3-SB11-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04147K	C3-SB12-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04148L	C3-SB13-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04149M	C3-SB13-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04150E	C3-SB14-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04151F	C3-SB15-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04152G	C3-SB15-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04153H	C3-SB16-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04154J	C3-SB16-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

**EXCEPTIONS**

1. **Packaging and shipping** – No problems were observed.
2. **Documentation** – No problems were observed.
3. **Sample preparation** – No problems were encountered.
4. **Analysis** – No problems were encountered.
5. **Holding times** – No holding times were specified.

**QUALITY CONTROL**

1. **QC samples** – All QC analysis results met NAREL acceptance criteria.
2. **Yields** – All chemical yields were within acceptance limits.
3. **Instruments** – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

## ACCREDITATION



All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

## CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

A handwritten signature in black ink, appearing to read "Velinda Herbert".

6/30/16

Date

Velinda Herbert

Quality Assurance Manager, NAREL

A handwritten signature in black ink, appearing to read "Cynthia White".

6-30-16

Date

Cynthia White

Director, Center for Environmental Radioanalytical  
Laboratory Science

## GENERAL INFORMATION

### SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

### ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for $^{228}\text{Ra}$ yield determination)

### QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

### RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

### EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "Z scores." A Z score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The Z score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The Z score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either  $|Z| \leq 3$  or  $60 \leq \%R \leq 110$ .

USEPA

Date Shipped: 4/18/2016  
 Carrier Name: FedEx  
 Airbill No: 8322 3572 1333

**CHAIN OF CUSTODY RECORD**  
 Canadian Radium & Uranium Corp/NY  
 Contact Name: Bernard Nwosu  
 Contact Phone: (908) 565-2980

No: 2-041816-105138-0008  
 Lab: NAREL  
 Lab Contact: Tonya Hudson  
 Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C003-SB007-3648-02	4/5/2016	16:23	Gamma, Spec. Modified ✓	Soil	4 C	N	1	16 oz. glass jar
	C003-SB007-3648-01	4/5/2016	16:23	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz. glass jar
3	C003-SB007-3648-01✓	4/5/2016	16:23	Gamma, Spec. Modified ✓	Soil	4 C	N	1	8 oz. glass jar ✓
3	C003-SB008-0012-01✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz. glass jar ✓
3	C003-SB008-0012-01✓	4/5/2016	16:58 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz. glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	2	8 oz. glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Isotopic Thorium ✓	Soil	4 C	Y	2	8 oz. glass jar ✓
3	C003-SB008-1224-01 ✓	4/5/2016	16:59 ✓	Gamma, Spec. Modified ✓	Soil	4 C	N	1	16 oz. glass jar ✓
3	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz. glass jar
3	C003-SB009-0012-01	4/5/2016	18:02	Isotopic Uranium ✓	Soil	4 C	N	1	16 oz. glass jar
3	C003-SB009-0012-01	4/5/2016	18:02	Gamma Spec. (Modified)	Soil	4 C	N	1	16 oz. glass jar
3	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz. glass jar
3	C003-SB009-1224-01	4/5/2016	18:02	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz. glass jar
3	C003-SB009-1224-01	4/5/2016	18:02	Gamma Spec. (Modified)	Soil	4 C	N	1	16 oz. glass jar
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz. glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz. glass jar ✓
3	C003-SB010-0012-01 ✓	4/5/2016	15:52 ✓	Gamma Spec. (Modified) ✓	Soil	4 C	N	1	16 oz. glass jar ✓

Special Instructions: Sample Analysis PO#-0081196: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Th-208, Bi-212, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210. Email results to s.sumbaly@westonsolutions.com and bern.nwosu@westonsolutions.com		SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #	
Item/Reason	Retirnguished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)
	Bernard Nwosu	8:45 AM 25/7/16	Catherine Nwosu

USEPA  
Date Shipped: 4/18/2016  
Carrier Name: FedEx  
Airtel No: 8022 3572 1393

**CHAIN OF CUSTODY RECORD**  
Canadian Radium & Uranium Company  
Contact Name: Bernard Navous  
Contact Phone: (908) 565-2980

No. 2-041816-105138-0008  
Lab: NARL  
Lab Contact: Tanya Hudson  
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-1224-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4C	N	1	16 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-6072-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4C	N	1	16 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-7284-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-8486-01 ✓	4/5/2016	15:52 ✓	Gamma Spec (Modified) ✓	Soil	4C	N	1	16 oz glass jar ✓
3	C003-SB010-8486-01 ✓	4/5/2016	15:52 ✓	Isotopic Thorium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB010-8486-01 ✓	4/5/2016	15:52 ✓	Isotopic Uranium ✓	Soil	4C	N	1	8 oz glass jar ✓
3	C003-SB011-0012-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓	Soil	4C	N	1	16 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Thorium ✓	Soil	4C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Isotopic Uranium ✓	Soil	4C	N	1	8 oz glass jar ✓
4	C003-SB011-0012-01 ✓	4/6/2016	11:13	Gamma Spec (Modified) ✓	Soil	4C	N	1	16 oz glass jar ✓
3	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Thorium ✓	Soil	4C	N	1	8 oz glass jar ✓

SPECIAL INSTRUCTIONS: Sample Analysis: PO# 0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Th-232, Bi-214, Pb-212, Po-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.sumikay@westonsolutions.com and ben.nwosa@westonsolutions.com				SAMPLES TRANSFERRED FROM:		SAMPLE CONDITION UPON RECEIPT	
Item/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Condition	Date/Time	
	Bernard Navous EST3	4/18/16 11:15	Tanya Hudson NARL	4/18/16 11:15	Broken Jar	4/18/16 11:15	

USEPA

Date Shipped: 4/18/2016

Carrier Name: FedEx

Attn#: No. 8022 3572 1333

## CHAIN OF CUSTODY RECORD

Canadian Radium &amp; Uranium Company

Contact Name: Bernard Nwosu

Contact Phone: (908) 565-2980

No: 2-041816-105138-0008

Lab: NAREL

Lab Contact: Tonya Hudson

Lab Phone: (313) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Container	Numb Cont
	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Isotopic Uranium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB012-0012-01 ✓	4/6/2016	11:35 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1 16 oz glass jar ✓	
	C003-SB013-0012-01 ✓	4/6/2016	12:00	Isotopic Thorium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB013-0012-01 ✓	4/6/2016	12:00	Isotopic Uranium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB013-0012-01 ✓	4/6/2016	12:00	Gamma Spec (Modified) ✓	Soil	4 C	N	1 16 oz glass jar ✓	
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Thorium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB013-1224-01	4/6/2016	12:01	Isotopic Uranium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB013-1224-01	4/6/2016	12:01	Gamma Spec (Modified) ✓	Soil	4 C	N	1 16 oz glass jar ✓	
	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Thorium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB014-0012-01 ✓	4/6/2016	12:28	Isotopic Uranium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB014-0012-01 ✓	4/6/2016	12:28	Gamma Spec (Modified) ✓	Soil	4 C	N	1 16 oz glass jar ✓	
	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB015-0012-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1 16 oz glass jar ✓	
	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Thorium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Isotopic Uranium ✗	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB015-2436-01 ✓	4/6/2016	10:43 ✓	Gamma Spec (Modified) ✓	Soil	4 C	N	1 16 oz glass jar ✓	
	C003-SB016-0012-01 ✓	4/6/2016	08:35	Isotopic Thorium ✓	Soil	4 C	N	1 8 oz glass jar ✓	
	C003-SB016-0012-01 ✓	4/6/2016	08:35	Isotopic Uranium ✓	Soil	4 C	N	1 8 oz glass jar ✓	

SAMPLES TRANSFERRED FROM				SAMPLES TRANSFERRED TO			
Item/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt	Date/Time	Sample Condition Upon Receipt
	Bernard Nwosu RST3	4/6/16 11:15	John Nwosu	4/6/16 11:15	Good ✓	4/6/16 11:15	Good ✓

Special Instructions: Sample Analysis PO#-00941-98: Gamma Spectroscopy analysis for soil samples to include: Ra-228 (in-growth), Ra-228, K-40, Th-232, Bi-212, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Sr-210. Email results to s.sumby@westonsolutions.com and bern.nwosu@westonsolutions.com

USEPA

Date Shipped: 4/18/2016

Carrier Name: FedEx

Address: 8022 3572 1333

**CHAIN OF CUSTODY RECORD**  
 Canadian Radium & Uranium Company  
 Contact Name: Bernard Nwosu  
 Contact Phone: (906) 565-2980

No: 2-041816-105138-0008  
 Lab: NAREL  
 Lab Contact: Tonya Hullson  
 Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
	C003-SB016-0012-01	4/6/2016	08:35	Gamma Spec (Matched) ✓	Soil	4 C	N	1	16 oz Glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz Glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz Glass jar
	C003-SB016-3648-01	4/6/2016	08:36	Gamma Spec (Matched) ✓	Soil	4 C	N	1	16 oz Glass jar
<i>Bernard Nwosu</i>									

Special Instructions: Sample Analysis P04-0091198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (in-growth), Ra-228, K-40, Th-228, Bi-212, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, U-235, Pb-210. Email results to ssumbilly@westonsolutions.com and bern.nwosu@westonsolutions.com		SAMPLES TRANSFERRED FROM _____ CHAN OF CUSTODY # _____	
Items/Reason	Reinbursed by (Signature and Organization)	Date/Time	Received by (Signature and Organization)

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**ANALYSIS SUMMARY**

Analysis method: NAREL ACT-02F-TH  
 Title: Isotopic Thorium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04138J	C3-SB9-0012-01		06/23/2016	0013480P	0020964H
B6.04139K	C3-SB9-1224-01		06/23/2016	0013480P	0020964H
B6.04140C	C3-SB10-0012-01		06/23/2016	0013480P	0020964H
B6.04141D	C3-SB10-1224-01		06/23/2016	0013480P	0020964H
B6.04142E	C3-SB10-6072-01		06/23/2016	0013480P	0020964H
B6.04142E	C3-SB10-6072-01	DUP	06/23/2016	0013480P	0020964H
B6.04143F	C3-SB10-7284-01		06/23/2016	0013480P	0020964H
B6.04144G	C3-SB10-8496-01		06/23/2016	0013480P	0020964H
B6.04145H	C3-SB11-0012-01		06/24/2016	0013480P	0020966K
B6.04146J	C3-SB11-3648-01		06/24/2016	0013480P	0020966K
B6.04147K	C3-SB12-0012-01		06/24/2016	0013480P	0020966K
B6.04148L	C3-SB13-0012-01		06/24/2016	0013480P	0020966K
B6.04149M	C3-SB13-1224-01		06/24/2016	0013480P	0020966K
B6.04150E	C3-SB14-0012-01		06/24/2016	0013480P	0020966K
B6.04151F	C3-SB15-0012-01		06/24/2016	0013480P	0020966K
B6.04152G	C3-SB15-2436-01		06/24/2016	0013480P	0020966K
B6.04153H	C3-SB16-0012-01		06/24/2016	0013480P	0020966K
B6.04154J	C3-SB16-3648-01		06/24/2016	0013480P	0020966K
LCS-00736018Z *		LCS	06/23/2016	0013480P	0020964H
RBK-00736017Y *		RBK	06/23/2016	0013480P	0020964H

\* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04138J	Amount analyzed:	7.943e-01 GASH
Client sample ID:	C3-SB9-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.88 %	Analyst:	SPK
Ash/dry weight:	93.31 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS144	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	6.99e-02	4.6e-02	4.3e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	3.79e-01	8.3e-02	3.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	5.47e-01	1.1e-01	6.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	3.17e-01	7.4e-02	2.4e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04139K	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB9-1224-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 18:02 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	94.08 %	Analyst:	SPK
Ash/dry weight:	96.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS125	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	-3.48e-03	1.2e-02	3.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	4.64e-01	8.7e-02	2.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	9.52e-01	1.4e-01	5.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	4.98e-01	9.1e-02	1.5e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04140C	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C3-SB10-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	97.86 %	Analyst:	SPK
Ash/dry weight:	92.49 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS129	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	8.28e-02	4.2e-02	3.1e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	4.61e-01	8.2e-02	3.1e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	4.39e-01	8.3e-02	5.3e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	5.43e-01	9.0e-02	1.9e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04141D	Amount analyzed:	1.012e+00 GASH
Client sample ID:	C3-SB10-1224-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.93 %	Analyst:	SPK
Ash/dry weight:	92.48 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS132	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	7.01e-01	1.5e-01	2.6e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	8.61e-01	1.3e-01	1.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	1.50e+01	1.5e+00	5.4e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	9.06e-01	1.4e-01	2.0e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04142E	Amount analyzed:	1.013e+00 GASH
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.93 %	Analyst:	SPK
Ash/dry weight:	88.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS134	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	2.48e-01	7.3e-02	2.9e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	1.79e+00	2.1e-01	2.5e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	4.46e+00	4.6e-01	5.0e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	1.67e+00	2.0e-01	1.6e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04142E	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB10-6072-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.93 %	Analyst:	SPK
Ash/dry weight:	88.93 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS135	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	2.76e-01	8.4e-02	3.1e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	1.67e+00	2.2e-01	2.0e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	4.24e+00	4.7e-01	5.2e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	1.56e+00	2.0e-01	1.8e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04143F	Amount analyzed:	9.732e-01 GASH
Client sample ID:	C3-SB10-7284-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	64.74 %	Analyst:	SPK
Ash/dry weight:	77.25 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS136	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	2.55e-01	8.9e-02	3.9e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	2.35e+00	3.2e-01	2.7e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	3.98e+00	5.0e-01	5.2e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	2.38e+00	3.2e-01	2.7e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04144G	Amount analyzed:	9.936e-01 GASH
Client sample ID:	C3-SB10-8496-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020964H
Collected:	2016-04-05 15:52 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	71.62 %	Analyst:	SPK
Ash/dry weight:	92.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS140	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.32e-01	5.8e-02	3.8e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th228	1.06e+00	1.6e-01	2.3e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th230	1.13e+00	1.7e-01	5.5e-02	PCI/GDRY	06/22/2016 17:11 CDT
Th232	1.22e+00	1.7e-01	1.9e-02	PCI/GDRY	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04145H	Amount analyzed:	9.616e-01 GASH
Client sample ID:	C3-SB11-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.90 %	Analyst:	SPK
Ash/dry weight:	94.29 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS97	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.48e-01	8.9e-02	5.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	1.04e+00	2.1e-01	4.5e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	7.89e-01	1.8e-01	7.5e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.50e-01	1.9e-01	4.5e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04146J	Amount analyzed:	1.007e+00 GASH
Client sample ID:	C3-SB11-3648-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 11:13 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	87.49 %	Analyst:	SPK
Ash/dry weight:	97.41 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS98	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.01e-01	4.9e-02	3.2e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	6.86e-01	1.1e-01	2.0e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	4.44e-01	8.9e-02	5.6e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	7.01e-01	1.1e-01	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04147K	Amount analyzed:	1.018e+00 GASH
Client sample ID:	C3-SB12-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 11:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	98.86 %	Analyst:	SPK
Ash/dry weight:	80.06 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS99	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.26e-01	5.2e-02	2.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	4.04e-01	7.6e-02	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	3.64e-01	7.5e-02	4.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	4.58e-01	8.3e-02	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04148L	Amount analyzed:	1.004e+00 GASH
Client sample ID:	C3-SB13-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 12:00 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	99.04 %	Analyst:	SPK
Ash/dry weight:	83.55 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS100	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	5.55e-02	4.5e-02	4.5e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	5.11e-01	1.1e-01	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	5.34e-01	1.2e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	5.85e-01	1.2e-01	2.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04149M	Amount analyzed:	1.031e+00 GASH
Client sample ID:	C3-SB13-1224-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 12:01 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	93.44 %	Analyst:	SPK
Ash/dry weight:	98.23 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS101	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.23e-01	5.5e-02	2.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	6.55e-01	1.1e-01	1.9e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	1.24e+00	1.8e-01	5.6e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	4.97e-01	9.1e-02	1.5e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04150E	Amount analyzed:	9.574e-01 GASH
Client sample ID:	C3-SB14-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 12:28 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	97.41 %	Analyst:	SPK
Ash/dry weight:	91.39 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS103	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	8.24e-02	4.8e-02	3.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	4.73e-01	9.5e-02	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	6.46e-01	1.2e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	4.66e-01	9.3e-02	2.6e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04151F	Amount analyzed:	9.994e-01 GASH
Client sample ID:	C3-SB15-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	85.96 %	Analyst:	SPK
Ash/dry weight:	95.51 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS104	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.17e-01	5.7e-02	3.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	9.16e-01	1.5e-01	3.4e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	7.78e-01	1.3e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.45e-01	1.4e-01	2.5e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04152G	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C3-SB15-2436-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 10:43 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.97 %	Analyst:	SPK
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS105	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	8.92e-02	4.9e-02	4.2e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	8.13e-01	1.3e-01	2.7e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	5.41e-01	1.0e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.49e-01	1.3e-01	1.9e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04153H	Amount analyzed:	9.052e-01 GASH
Client sample ID:	C3-SB16-0012-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 08:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	96.85 %	Analyst:	SPK
Ash/dry weight:	93.53 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS106	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.06e-01	5.5e-02	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	6.68e-01	1.2e-01	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	4.87e-01	1.0e-01	6.2e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	6.04e-01	1.1e-01	1.8e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04154J	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C3-SB16-3648-01	Preparation batch #:	0013480P
Matrix:	SOIL	Assay batch #:	0020966K
Collected:	2016-04-06 08:36 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	88.04 %	Analyst:	SPK
Ash/dry weight:	97.34 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/23/2016 16:19	1000.0	AS107	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.16e-01	5.6e-02	2.9e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th228	8.07e-01	1.3e-01	3.1e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th230	7.02e-01	1.2e-01	5.8e-02	PCI/GDRY	06/23/2016 16:19 CDT
Th232	8.60e-01	1.4e-01	1.6e-02	PCI/GDRY	06/23/2016 16:19 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	LCS-00736018Z	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013480P
Matrix:	N/A	Assay batch #:	0020964H
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS141	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	5.89e-02	3.9e-02	4.1e-02	PCI	06/22/2016 17:11 CDT
Th228	1.71e-02	1.7e-02	2.2e-02	PCI	06/22/2016 17:11 CDT
Th230	2.16e+00	2.4e-01	5.7e-02	PCI	06/22/2016 17:11 CDT
Th232	1.14e-02	1.5e-02	2.2e-02	PCI	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600017**

**SAMPLE ANALYSIS REPORT**

Lab sample #:	RBK-00736017Y	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013480P
Matrix:	N/A	Assay batch #:	0020964H
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

**COUNTING INFORMATION**

Date and time	Duration (min)	Detector ID	Operator
06/22/2016 17:11	1000.0	AS142	RCL

**ANALYTICAL RESULTS**

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.17e-01	5.4e-02	4.0e-02	PCI	06/22/2016 17:11 CDT
Th228	1.20e-02	2.1e-02	3.6e-02	PCI	06/22/2016 17:11 CDT
Th230	3.57e-02	3.6e-02	5.8e-02	PCI	06/22/2016 17:11 CDT
Th232	1.10e-02	1.4e-02	1.8e-02	PCI	06/22/2016 17:11 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG 1600017**

**PREPARATION BATCH SUMMARY**

Preparation batch #: 0013480P  
 Analysis method: NAREL ACT-02F-TH  
 Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	$\pm 2\sigma$ Uncertainty	Analyst
B6.04138J	C3-SB9-0012-01	00733735K		77.41 %	6.84 %	SPK
B6.04139K	C3-SB9-1224-01	00733738N		91.15 %	8.12 %	SPK
B6.04140C	C3-SB10-0012-01	00733741H		81.54 %	6.98 %	SPK
B6.04141D	C3-SB10-1224-01	00733744L		86.17 %	7.81 %	SPK
B6.04142E	C3-SB10-6072-01	00733747P		88.02 %	7.43 %	SPK
B6.04142E	C3-SB10-6072-01	00736016X	DUP	92.02 %	8.41 %	SPK
B6.04143F	C3-SB10-7284-01	00733750J		63.96 %	6.73 %	SPK
B6.04144G	C3-SB10-8496-01	00733753M		80.40 %	7.38 %	SPK
B6.04145H	C3-SB11-0012-01	00733756Q		41.54 %	5.21 %	SPK
B6.04146J	C3-SB11-3648-01	00733759U		92.46 %	8.15 %	SPK
B6.04147K	C3-SB12-0012-01	00733762N		85.03 %	7.81 %	SPK
B6.04148L	C3-SB13-0012-01	00733765R		58.64 %	6.44 %	SPK
B6.04149M	C3-SB13-1224-01	00733768V		87.51 %	7.91 %	SPK
B6.04150E	C3-SB14-0012-01	00733771P		79.37 %	7.55 %	SPK
B6.04151F	C3-SB15-0012-01	00733774T		78.55 %	7.43 %	SPK
B6.04152G	C3-SB15-2436-01	00733777W		84.29 %	7.70 %	SPK
B6.04153H	C3-SB16-0012-01	00733780Q		83.08 %	7.77 %	SPK
B6.04154J	C3-SB16-3648-01	00733783U		79.17 %	7.37 %	SPK
LCS-00736018Z *		00736018Z	LCS	83.88 %	7.24 %	SPK
RBK-00736017Y *		00736017Y	RBK	77.71 %	6.87 %	SPK

\* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**QC RESULTS FOR BATCH 0013480P**

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04142E	00736016X	DUP	TH227		10.7	0.50	PASS
B6.04142E	00736016X	DUP	TH228		6.5	-0.75	PASS
B6.04142E	00736016X	DUP	TH230		5.0	-0.66	PASS
B6.04142E	00736016X	DUP	TH232		6.8	-0.77	PASS
LCS-00736018Z	00736018Z	LCS	TH230	108.2		1.33	PASS
RBK-00736017Y	00736017Y	RBK	TH227				WARN
RBK-00736017Y	00736017Y	RBK	TH228				PASS
RBK-00736017Y	00736017Y	RBK	TH230				PASS
RBK-00736017Y	00736017Y	RBK	TH232				PASS